

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Ball Joint

We, CARL HEIMANN and HANS VON COSSEL, both of German nationality and both of Hansa-Allee 190, Düsseldorf-Oberkassel, Germany, and FRITZ FAUDI, of German nationality, of Reichenbachweg 11, Falkenstein im Thaurus, Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to ball joints of the type that can be taken apart, where the ball bolt is inserted in the casing of the joint and is held in its bearing by means of a radially operating spring which engages automatically behind the ball head and forms a bearing for the ball. In known ball joints of this kind the spring locking device is arranged so that it serves as the under bearing for the joint which has to be put together in the manner of a spring button. In such an arrangement the ball head is only held in the casing of the joint with that amount of force as is exercised by the spring locking means, for example a spring ring, so that if the joint is subjected to any great strain, the ball head is withdrawn from the casing.

Ball joints are also known in which the casing is formed so that it allows the ball bolt to be passed through an opening at the top of the casing. But in this case the ball joint cannot be easily taken apart but the parts of the joint are closed by spinning over the edges of the casing, so that the ball bolt cannot be removed without destroying the joint. It is however essential that the ball bolt should be capable of being withdrawn for replacing part of the joint, for example a detachable bearing or a major part of the joint, it may be necessary to take the joint apart for disconnecting the shafting in which the ball joint is inserted.

It has also been proposed to form the ball bolt which is to be inserted in a casing, and the ball, in two distinct parts. Here also the ball joint has not been capable of being easily taken apart and the ball must be pushed from below on to the end of the bolt, which increases in diameter upwardly, so that in the case of the joint having to be taken apart the bolt

must be unscrewed from its shafting. The same holds good for known forms of joints with conical bearings with a 90° rotation for use with hinge joints having a limited ball movement, which therefore cannot be taken apart without unscrewing the ball bolt.

The subject of the present invention is a ball bolt capable of being taken apart, in which the bearing of the joint, in order that the bolt and its separable bolt head may be readily inserted and removed, is formed with an upper opening and according to the present invention the one piece ball head is slipped onto the bolt from above through the upper opening and is in known manner held in position by a radially operating spring device and the ball head is attached to the bolt by means of an easily detachable holding means. The safety device for holding in position the ball head, which is slipped onto a conical part of the ball bolt, consists conveniently of a ring shaped holding disc, open at one side and adapted to engage or be pressed into a groove around the end of the bolt, a device which in itself is already known.

In the new joint there are retained the advantages of simple construction and easy assembly and disassembly of the joint that are found in the known press button type of ball joint, but there results, as contrasted with the latter, complete protection against the parts inadvertently becoming separated and complete reliability in operation to meet all requirements. A further advantage is that it is made possible for the ball head by itself to be better hardened and polished, whilst the ball may have normal hardness and can consequently be more easily provided with a thread. Owing to the fact that the bolt together the ball head is pushed through the opening in the top of the joint casing, both parts are ensured against falling downwards. When therefore the bolt has been screwed up it is impossible for the joint to come apart completely. A further advantage is the circumstance that the ball head, after its safety catch has been removed can be withdrawn upwards. The joint therefore can be taken apart without the bolt itself being unscrewed. The connection between

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ball head and bolt is easily severed by a turn of the hand. Owing to these additional facilities for freeing the ball head it follows that, besides the ball head being easily pressed out of its bearing, the ball head can be easily removed and without it being necessary to unscrew the bolt. As the retention device for the ball head can be housed within the casing of the joint or within its upper opening, the device if it should come loose will always automatically be returned into the safety position owing to the oscillations of the parts of the joints relatively to one another during use. The said features mutually support one another in their functions and together they serve to provide a ball joint which is very cheap and simple to manufacture and as such can easily be taken apart and reassembled and still remains exceedingly reliable in operation.

In the accompanying drawing the invention is illustrated in one construction by way of example,

Fig. 1 being of vertical section and

Fig. 2 being of horizontal section on the line A—B in Fig. 1.

The ball joint consists of a casing part 1 with a bore 2 for the passage of the ball head 11 which is connected detachably with the bolt 9. The latter has for example a conical part 10 upon which the ball head 11, which has a bore to fit the part 10, is pushed. The part 10 is provided at the end which extends beyond the ball with an annular groove 12, in which engages an annular disc 13 which is open on one side and is resilient or can be closed up, and this disc 13 lies against a flat on the ball 11 and holds the latter fast. The ball part 10, 11, which is inserted in the casing 1 from above is held in the position of operation by means of a spring ring 5 or the like which forms the upper bearing.

The connection between the parts 1 and 10 is very easily broken, for the ball can be jerked out of the bearing and the safety device 13 is then removed and the bearing can be pulled up and the ball 11 removed from the bolt and the joint is completely taken apart. It is therefore unnecessary to unscrew the bolt.

The safety device for the ball head 11 can also be in the form of a split pin or the like.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A ball joint capable of being taken apart, in which the bearing which allows the pin of the joint, consisting of the bolt and the ball head, to be removed or inserted through an opening in the top of the casing, characterised by the fact that the ball head, which is in one piece, is held fast at the upper open end of the bearing by means of a locking device of known type resilient radially, is mounted on the bolt from above and is connected with the bolt by a securing device which is easily removed.

2. Ball joint as claimed in claim 1 characterised by the fact that the safety device for the ball head (11) which is mounted on the conical part (10) of the ball bolt (9) consists in known manner of a ring shaped holding disc (13) which is open on one side and is adapted to engage in an annular groove (12) in the part (10).

Dated this 20th day of February, 1941.

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Fig.1.

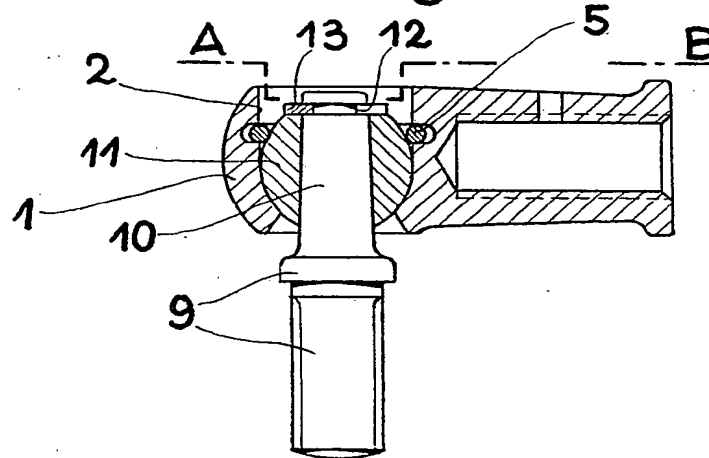
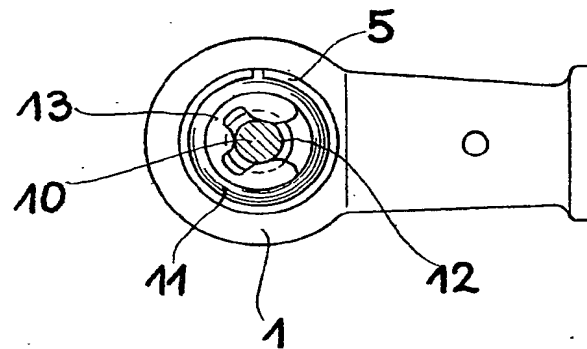


Fig.2,(A-B).



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